invention, there is provided an image encoding method of compressing and encoding an input image frame, comprising:

dividing the input image frame into a plurality of blocks;

detecting a motion vector of each of the plurality of blocks;

classifying the plurality of blocks into one or more groups, according to one or two grouping method selected from motion vector based grouping based on the value of the detected motion vector and DC component based grouping based on DC components of brightness and color information of each block;

calculating a first weighting coefficient of the one or more groups in a case where the plurality of blocks are classified according to the motion vector based grouping, and calculating a second weighting coefficient of the one or more groups in a case where the plurality of blocks are classified according to the DC component based grouping; and

quantizing each of the plurality of blocks by a quantization step width determined based on the first or second weighting coefficient.

According to the image encoding method, each portion of the display screen can be classified by the brightness or color information, even there is no motion in the input image, and the important portion, such as a person's image, etc. can be encoded in a high level of preciseness.

In a case where the motion vector is detected, the classifying may classify the plurality of blocks according to the motion vector based grouping, and the quantizing quantizes each of the plurality of blocks by the quantization step width determined based on the first weighting coefficient; and

in a case where the motion vector is not detected, the classifying may classify the plurality of blocks according to DC component based grouping, and the quantizing quantizes each of the plurality of blocks by the quantization step width determined based on the second weighting coefficient.

In a case where the motion vector is detected:

the classifying may classify the plurality of blocks according to motion vector based grouping and the DC component based grouping; and

the quantizing may quantize each of the plurality of blocks by the quantization step width determined based on both the first and second weighting coefficients.

Having classified the plurality of blocks according to motion vector and DC component, the important portion of the input image can be encoded in a high level of preciseness, even in the case where the input image is move in its entirety.

The weighting coefficient calculating may calculate the first weighting coefficient based on number of blocks included in each of the one or more groups classified according to motion vector based grouping.

The weighting coefficient calculating may calculate the second weighting coefficient based on a distance between center of each of the plurality of blocks, included in each group of the one or more groups classified according to DC component based grouping, and center of the input image frame.

In order to achieve the above objects, according to the second aspect of the present invention, there is provided an image encoder which compresses and encodes an input image frame, the image encoder comprising:

a frame divide circuit which divides the input image frame into a plurality of blocks;

a motion prediction circuit which detects a motion vector of each of the plurality of blocks;

an interframe prediction circuit which generates differential data in the plurality of blocks based on the motion vector detected by the motion prediction circuit;

an orthogonal transformation circuit which performs discrete cosine transformation for the differential data generated by the interframe prediction circuit, and calculates DC components of brightness and color information of each of the plurality of blocks;

a weighting section which calculates a quantization step width for use in quantizing resultant data of the discrete cosine transformation performed by the orthogonal

transformation circuit based on the motion vector detected by the motion prediction circuit and the DC components calculated by the orthogonal transformation circuit; and

a quantization circuit which quantizes the resultant data of the discrete cosine transformation performed by the orthogonal transformation circuit, by the quantization step width calculated by the weighting section.

According to such an image encoder, each portion of the display screen can be classified based on the brightness or color information of each block, even in the case where there is no motion in the input image, and the important portion, such as a person's image, etc. can be encoded in a high level of preciseness.

The weighting section may includes:

a motion vector based grouping section which classifies the plurality of blocks into one or more groups, based on a value of the motion vector detected by the interframe prediction circuit;

a DC component based grouping section which classifies the plurality of blocks into one or more groups, based on the DC components of each of the plurality of blocks which are calculated by the orthogonal transformation circuit;

a weighting coefficient calculation circuit which calculates a weighting coefficient for determining the quantization step width for each of the plurality of blocks; and

a quantization step width calculation circuit which calculates the quantization step width based on the weighting coefficient calculated by the weighting coefficient calculation circuit, and

wherein the weighting coefficient calculation circuit calculates a first weighting coefficient for the one or more groups classified by the motion vector based grouping section, calculates a second weighting coefficient for the one or more groups classified by the DC component based grouping section, and calculates a weighting coefficient for determining the quantization step width based on one or two weighting coefficients